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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/715,935	11/17/2000	Xiangxin Bi	2950.16US02	9146
62274 7590 12/06/2007 DARDI & ASSOCIATES, PLLC 220 S. 6TH ST. SUITE 2000, U.S. BANK PLAZA MINNEAPOLIS, MN 55402			EXAMINER STOUFFER, KELLY M	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 12/06/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 09/715,935	<b>Applicant(s)</b> BI ET AL.	
	<b>Examiner</b> Kelly Stouffer	<b>Art Unit</b> 1792	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 October 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 18,20-38 and 62-73 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33-38 and 71-73 is/are allowed.
- 6) ☒ Claim(s) 18,20-28 and 62-70 is/are rejected.
- 7) ☒ Claim(s) 29-32 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/19/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 25 October 2007 have been considered but are moot in view of the new ground(s) of rejection necessitated by amendments.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 18, 20, 22-28, 62 and 64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thaler (US Patent 5547716) in view of Whitney et al. (US Patent 5043548).

Regarding claim 18, Thaler discloses a method of coating a substrate comprising reacting a reactant stream within a flow (see Figures) by directing a light beam at the reactant stream to produce within the flow a product stream comprising particles downstream from the radiation beam, or at least the effective area of the light beam, wherein the particles are produced by a chemical reaction driven by the light beam and the flow passes through the radiation beam and is directed towards a substrate (columns 8-9 lines 62-25) and the light beam does not intersect the substrate (Figure 13). Thaler does not include moving the substrate relative to the flow of the product stream but does describe a desire to coat large substrates (column 9 lines 34-53). Whitney et al. teaches moving the substrate relative to the product stream (column 7 lines 41-48). One of ordinary skill in the art would recognize that allowing the substrate to move would coat larger substrates more easily, and in addition, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. See *KSR International Co. v. Teleflex Inc.*, 550 U.S.--,

82 USPQ2d 1385 (2007). Though Thaler uses the energy beam to enact either a physical or chemical change on the reactants and Whitney et al. uses the energy beam to melt the reactants (abstract), it would be readily apparent to one of ordinary skill in the art that the chemical or physical change depends upon the reactants used.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thaler to include a moving substrate as taught by Whitney et al. to coat large substrates more efficiently and to obtain predictable results.

As to claim 20, the light beam is generated by a laser in Thaler (abstract).

As to claim 22, Thaler shows elongation of the reactant stream in the Figures.

Regarding claims 23, 24 and 26 the substrate may move relative to the product stream in Whitney et al. (Fig. 2 and Examples) to deposit product particles on the substrate from a reactant stream elongated in a direction along the propagation of the reactant beam or laser.

Regarding claim 25, it was determined by the examiner that the broad language of the claim encompasses removing one substrate from the apparatus, and replacing the substrate with another. It would have been obvious to one of ordinary skill in the art to achieve this as the apparatus was made to process more than one substrate in its lifetime.

Regarding claims 27 and 28, Whitney et al. also discloses that the reactant inlet or nozzle may move relative to the substrate to sweep particles across the substrate in column 7 lines 41-43 and the conduit or nozzle of Whitney et al. is shown in Fig. 2 and the reactant inlet or nozzle may move relative to the substrate to sweep particles across

the substrate in column 7 lines 41-43 with the same obviousness reasoning discussed above in reference to claim 18. Thaler additionally represents conduits and nozzles in the Figures and with their corresponding descriptions in the patent.

As to claim 62, the light beam is generated by a laser in Thaler (abstract).

As to claim 64, Thaler shows elongation of the reactant stream in the Figures.

Claims 21, 63 and 65-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thaler and Whitney et al. as described above and in further view of US Patent number 5874134 to Rao et al.

Thaler and Whitney et al. include the provisions of claims 65-68 and 70 as discussed above. In addition Whitney et al. shows only depositing a layer on a portion of a substrate in Figure 2 and describes the desirability of only coating portions of the substrate in column 1 et seq. Thaler and Whitney et al. do not include a substrate that may be temperature controlled with means of heating and cooling the substrate. Rao et al. teaches that the substrate may be temperature controlled by means to heat and cool the substrate in order to prevent grain growth in the deposited layer and to make the deposited layer more dense (column 4 lines 34-67 and column 7 lines 2-10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thaler and Whitney et al. to include a substrate that may be temperature controlled with means of heating and cooling the substrate as taught by Rao et al. in order to prevent grain growth in the deposited layer and to make the deposited layer more dense.

Regarding claims 21, 63 and 69, Thaler and Whitney et al. include the provisions of these claims except for pumping on the reaction chamber to maintain flow or the stream of particles. Rao et al. describes pumping a on the vacuum chamber, which one of ordinary skill in the art would have recognized as maintaining flow or a stream of particles within the chamber, to remove byproducts from the chamber (column 6 lines 50-61).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Thaler and Whitney et al. to include pumping on the reaction chamber to maintain flow or a stream of particles as taught by Rao et al. in order to remove byproducts from the reaction chamber.

#### ***Allowable Subject Matter***

Claims 29-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 33-38 and 71-73 are allowed.

#### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly Stouffer whose telephone number is (571) 272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.




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Kelly Stouffer  
Examiner  
Art Unit 1792

kms



**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**